WE CLAIM:

1. An optical multiplexer/demultiplexer device comprising:

a first input/output port through which a wavelength division multiplexed (WDM) signal comprising a plurality of wavelength channels is input or output along a first path in free space;

a first optical filter disposed in the first path for transmitting at least a first predetermined wavelength channel of the WDM signal along the first path, and for reflecting other wavelength channels of the WDM signal at a reflection angle between the first path and a second path in free space;

a first add/drop port for outputting or inputting the first predetermined wavelength channel;

a second input/output port adjacent to the first input/output port for outputting or inputting the other wavelength channels of the WDM signal traveling along a third path in free space; and

a first prism for redirecting the other wavelength channels of the WDM signal traveling between the second path and the third path, whereby the position of the second input/output port is independent of the reflection angle and the required distance between the first add/drop port and the second input/output port is reduced.

2. The device according to claim 1, wherein the first prism has one reflective surface for redirecting the other wavelength channels.

3. The device according to claim 1, wherein the first prism has two reflective surfaces for redirecting the other wavelength channels.

4. The device according to claim 3, wherein the second path is substantially parallel to the third path.

5. An optical demultiplexer device comprising:

a first input/output port through which a wavelength division multiplexed (WDM) signal comprising a plurality of wavelength channels is input along an first path in free space;

a first optical filter disposed in the first path for transmitting at least a first predetermined wavelength channel of the WDM signal, and for reflecting a first sub-signal of the WDM signal along a second path in free space at an angle to the first path;

a first drop port for outputting at least the first predetermined wavelength channel transmitted by the first optical filter;

a first prism for redirecting the first sub-signal of the WDM signal traveling along the second path to a third path;

a second optical filter disposed in the third path for transmitting at least a second predetermined channel of the WDM signal, and for reflecting a second sub-signal of the WDM signal along a fourth path in free space at an angle to the third path; and

a second drop port adjacent to the first input/output port for outputting at least the second predetermined channel transmitted by the first optical filter;

whereby the position of the second drop port is independent of the angle between the second and third paths, and the required distance between the first drop port and the second drop port is reduced.

6. The device according to claim 5, further comprising;

a third optical filter in the fourth path for transmitting at least a third predetermined channel of the WDM signal, and for reflecting a third sub-signal of the WDM signal along a fifth path in free space at an angle to the fourth path;

a third drop port adjacent to the first drop port for outputting at least the third predetermined channel transmitted by the third optical filter

a second prism for redirecting the second sub-signal of the WDM signal traveling along the fifth path to a sixth path;

a fourth optical filter in the sixth path for transmitting at least a fourth predetermined channel of the WDM signal, and for reflecting a fourth sub-signal of the WDM signal along a seventh path in free space at an angle to the sixth path; and

a fourth drop port adjacent the second drop port for outputting at least the fourth predetermined channel transmitted by the fourth optical filter.

7. The device according to claim 6, further comprising a second input/output port for outputting any wavelength channels not transmitted by the optical filters.

8. The device according to claim 5, wherein the first prism has one reflective surface for redirecting the first sub-signal.

9. The device according to claim 5, wherein the first prism has two reflective surfaces for redirecting the first sub-signal.

10. The device according to claim 9, wherein the second path is substantially parallel to the third path.

11. The device according to claim 5, for multiplexing a WDM signal; wherein a signal traveling along the fourth path towards the second optical filter is multiplexed thereby with a signal comprising the second predetermined wavelength channel input the second drop port into a first combined signal; wherein the first combined signal is directed along the third path to the second path by the first prism; wherein the first combined signal is multiplexed by the first optical filter with a signal comprising the first predetermined wavelength channel input the first drop port into a second combined signal; and wherein the second combined signal is directed by the first optical filter for output the first input/output port.

12. An optical demultiplexer device comprising:

a housing for supporting a plurality of ports at the periphery, and defining a free space therein;

an input port through which a wavelength division multiplexed (WDM) signal comprising a plurality of wavelength channels is input into the free space;

a plurality of optical filters sequentially disposed in the path of said WDM signal, each filter for transmitting at least one predetermined channel of the WDM signal, and for reflecting the remainder of the WDM signal at an angle of reflection to be incident upon the next optical filter;

a plurality of drop ports, one drop port corresponding to each optical filter, for outputting the predetermined channels transmitted by the corresponding optical filter; and

a plurality of prisms for redirecting the WDM signal traveling between the plurality of optical filters, whereby the position of each drop port is dependent upon the prisms and independent of the angles of reflection.

13. The device according to claim 12, wherein each prism has one reflective surface for redirecting the reflected WDM signals.

14. The device according to claim 12, further comprising an output port for outputting any wavelength channels not transmitted by the plurality of optical filters.

15. The device according to claim 12, wherein the each prism has two reflective surfaces for redirecting the reflected WDM signals.

16. The device according to claim 15, wherein the WDM signal entering each prism along a first path exits each prism along a second path, which is parallel to the first path.

17. The device according to claim 15, wherein a first set of the optical filters are mounted on one side of the housing in a linear array, and wherein a second set of the optical filters are mounted on another side of the housing in a linear array, opposite to the first set of the optical filters.

18. The device according to claim 15, wherein the WDM signal enters each prism along a reflected path and exits each prism along an incident path, which is not parallel to the reflected path.

19. The device according to claim 18, wherein all of the drop ports are mounted on one side of the housing in a linear array.

20. The device according to claim 12, for use as a multiplexer.